Space Weather Forecast

Issued on Sunday, 05 February 2023 at 01:28 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Minor Geomagnetic Storm G1 from Day 3 (7 Feb).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been low over the past 24 hours, with X-ray activity limited to occasional minor Common-class flares. There are four sunspot regions on the Sun. A long-period Common-class event was observed to originate from the southeast at 04/0053UTC, and this was associated with a 'filament lift off' (arc of plasma leaving the Sun). Available imagery is congested with many apparently peripheral Coronal Mass Ejections (CMEs). Any Earth-directed CMEs are not considered to affect Earth until Day 3 (7 Feb).

Solar Wind / Geomagnetic Activity: Solar wind parameters were indicative of a slow wind regime. Solar winds were within normal background range and the number of particles comprising the wind was mostly within its typical range, with a decline noted. The magnetic field associated with these particles was Weak as was the important north-south component. The net effect of the above solar wind measures was Quiet to Unsettled geomagnetic activity.

Energetic Particles / Solar Radiation: No solar radiation storms were observed through the period.

Four-Day Space Weather Forecast Summary

Solar Activity: Low solar activity is expected, however there are signs that the arriving eastern solar horizon contains more potent active regions (from CME evidence, 'prominences' (arcs of plasma on the Sun's edge) and imagery), with a probable increase in activity therefore mooted for the coming UTC working week. This being said, until any regions show, the current slight chance of Moderate-class activity is held constant given the largely quiet current Earth-facing side.

Solar Wind / Geomagnetic Activity: No significant CMEs feature in the forecast at present. A slow regime and quiet conditions should predominate at first. Uncertainty surrounding the arrival (and now polarity) of the fast wind from a coronal hole leads to reduced confidence for much of the remainder of the period, although an upstream satellite implies any fast wind is at least a day away. Slightly Elevated to Elevated winds are most likely from this feature, with arrival possible from later Day 1 (5 Feb). Geomagnetic activity is expected to be Quiet to Unsettled with the greatest Chance of a Minor Storm interval from Day 3 (7 Feb).

Energetic Particles / Solar Radiation: No solar radiation storms are expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	5	15	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	5	5	10	20
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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